

U.S.S.N. 10/613,253

11

02-0889 (BOE 0350 PA)

REMARKS

In the Non-Final Office Action of June 17, 2005, claims 1-69 are pending. Claims 1, 21-22, 46, and 55-56 are independent claims from which all other claims depend therefrom. Claims 1, 16-17, 21-23, 46-47, 50, and 55 are herein amended. Note that claims 1, 16-17, 21-23, 46-47, 50, and 55 have not been amended for patentability reasons.

Claim 50 stands objected to because of informality reasons. Specifically, the Office Action states that claim 50 is dependent upon a claim 96, which does not exist. Applicants herein amended claim 50 to depend from claim 46.

Claims 1-69 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Mezan (U.S. Pat. No. 6,622,065 B2) and in view of Rollet et al. (U.S. Pat. No. 5,863,012A).

Amended claim 1 recites a method for determining the maximum acceleration and deceleration limits for the longitudinal or lateral axis of an aeronautical vehicle while maintaining a constant vertical state. The vehicle has a vertical control inceptor. The method includes determining a vertical inceptor position required to maintain a vertical state via a controller. Minimum and maximum allowable vertical inceptor position limits are determined for desired operation of the vehicle that allow the maintenance of the vertical state.

The claimed invention allows a vehicle operator to utilize the maximum and minimum accelerations and decelerations of a vehicle while maintaining a desired vertical state. The stated invention also can be used to prevent an aircraft or a vehicle operator from exceeding a limit and thus failing to maintain a vertical state. Examples of a vertical state that may be maintained are constant altitude, constant vertical velocity, and constant flight path angle.

The Office Action states that with respect to claims 1 and 15-69, that since Mezan discloses a flight control system that includes a control for controlling the pitch and roll attitude about relevant axis of the aircraft and a

U.S.N. 10/613,253

12

02-0889 (BOE 0350 PA)

control member or stick for controlling the pitch and roll attitude of an aircraft, that Mezan reads on the limitation of "determining a vertical inceptor position required to maintain a vertical state". Applicants, respectively, traverse. The control, which is disclosed in col. 1, lines 31-36 of Mezan, is directed to the angular rate of pitch and roll of the aircraft. The stated control determines the angular rate of pitch or roll based upon the deflection of the control member by a pilot. This control does not maintain a vertical state of the aircraft, or any state for that matter. The control rather directly responds to pitch and roll commands from the pilot and adjusts rate at which the aircraft performs such commands. Although the rates at which a pitch and/or roll command are performed may affect a vertical state of an aircraft, the simple act of determining these rates in response to deflection of a control member does not maintain a vertical state. The control of Mezan is reactive not proactive.

Applicants further submit that, in general, all helicopters have a control member or the like for manually controlling the pitch and roll of the aircraft. Without such a member a pilot would be unable to adequately control the pitch and roll aspects of the aircraft. The control member is a manual stick, which is used by the pilot to control the aircraft. Movement of the control member may affect the vertical state of the aircraft, but it does not in and of itself maintain a vertical state of the aircraft.

Thus, Mezan fails to read on the stated limitation as suggested by the Office Action. Nowhere in Mezan is there any mention of the maintenance of a vertical state, let alone the system or control necessary to perform such maintenance.

The Office Action states that since Rollet discloses a cyclic stick that is pushed or pulled at forces to accelerate or decelerate an aircraft and the maintenance of a new higher or lower speed, that Rollet inherently discloses the minimum and maximum inceptor position limits claimed. Applicants traverse.

U.S.S.N. 10/613,253

13

02-0889 (BOE 0350 PA)

Rollet discloses a cyclic stick system for speed stability. The purpose of the cyclic stick system is to restore correct handling as well as positive speed stability of an aircraft, which is longitudinally statically unstable. Rollet states in col. 2, lines 1-7 that certain aircraft have neutral or negative longitudinal static stability in a certain speed range. The system of Rollet adjusts a trim-release means, or in other words the position of the cyclic stick, to prevent an associated aircraft from operating within this speed range. This speed range has a bottom end V_{min} and an upper end V_{max} . At speeds between V_{min} and V_{max} the aircraft has unsatisfactory static longitudinal stability. The trim-release means is adjusted such that the aircraft is operated at speeds below V_{min} or above V_{max} or, in other words, outside the stated range.

The values V_{min} and V_{max} are not upper and lower speed limits of the aircraft, but are rather lower and upper bounds of a speed range. The aircraft is preferably operated at speeds below or above the range between V_{min} and V_{max} . As such, the values V_{min} and V_{max} are not position limits nor are they related to position limits of the cyclic stick.

Thus, Rollet does not inherently or explicitly disclose, teach, or suggest the state limitation. Applicants further submit that Mezan, like Rollet, also fails to teach or suggest the limitations of determining minimum and maximum allowable vertical inceptor position limits for desired operation of a vehicle that allow maintenance of a vertical state. Applicants are unable to find any disclosure or suggestion in Mezan of these limitations. As stated Mezan fails to provide any system or control for the maintenance of a vertical state and thus clearly fails to disclose determining inceptor position limits for such maintenance.

With respect to claim 21, Applicants submit that both Mezan and Rollet fail to teach or suggest alone or in combination the limitations of determining maximum and minimum limits of each of a plurality of operating parameters, providing the limits to a controller, and preventing the stated limits from being exceeded in a vehicle by the controller. Mezan does not determine any maximum or minimum limits. Rollet only discloses upper and lower bounds

U.S.S.N. 10/613,253

14

02-0889 (BOE 0350 PA)

of a speed range for which the system of Rollet exceeds and preferably operates outside thereof.

With respect to claims 22, 46, and 55, Applicants submit that both Mezan and Rollet fail to teach or suggest alone or in combination the limitations of determining a vertical inceptor position for maintaining a constant vertical state and generating a cueing signal for maintaining said constant vertical state in response to an airspeed signal, an attitude signal, a minimum inceptor position, and a maximum inceptor position. Applicants are unable to find anywhere in either reference where a minimum and a maximum inceptor position are determined. In addition, and with respect to claim 55 Mezan and Rollet also fail to teach or suggest the limitations of the controller in generating a cueing signal determines pitch attitudes and roll attitudes using conservation of energy based relationships and thrust and gravitational force based relationships. The stated relationships are not even mentioned in the stated references.

With respect to claim 56, Applicants submit that for the above-stated reasons both Mezan and Rollet fail to teach or suggest alone or in combination any of the limitations of claim 56.

Referring to MPEP 706.02(j) and 2143, to establish a *prima facie* case of obviousness the prior art reference(s) must teach or suggest all the claimed limitations, see *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Thus, Applicants submit that Mezan and Rollet fail to teach or suggest each and every limitation of claims 1, 21-22, 46, and 55-56, therefore, claims 1, 21-22, 46, and 55-56 are novel, nonobvious, and are in a condition for allowance. Also, since all other claims depend therefrom they too are also novel, nonobvious, and are in a condition for allowance for at least the same reasons.

Applicants submit that the dependent claims 2-20, 23-45, 47-54, and 57-69 contain many limitations that further distinguish them over the relied upon references. For example and to name a few, both Mezan and Rollet fail to teach or suggest the aural, visual, or tactile cueing of minimum and maximum inceptor position limits to maintain a vertical state, the

U.S.S.N. 10/613,253

15

02-0889 (BOE 0350 PA)

determining of inceptor limits in response to rotor torque, the determination of torque, overspeed, underspeed, vertical velocity, and the generation of a vehicle flight profile in response to the stated cueing. Many other claimed limitations are also not taught or suggested, but are not herein mentioned for lack of necessity.


Claim 8 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Mezan, Rollet, and further in view of Tomio et al. (U.S. Pat. No. 6,334,592 B1).

Applicants submit that since claim 8 depends from allowable claim 1 that it too is novel, and nonobvious, for at least the same reasons.

In light of the amendments and remarks, Applicants submit that all the rejections are now overcome. The Applicants have added no new matter to the application by these amendments. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited. Should the Examiner have any questions or comments, the Examiner is respectfully requested to contact the undersigned attorney.

Respectfully submitted,

ARTZ & ARTZ, P.C.


Jeffrey J. Chap, Reg. No. 80,579
28333 Telegraph Road, Suite 250
Southfield, MI 48034
(248) 223-9500

Dated: September 9, 2005